IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicants	:	Arthur L. Cleary et al.
Application No.	:	10/057,797
Filed	:	29 October 2001
For	:	PRINTING SYSTEM WITH VACUUM TABLE
Group Art Unit	:	3654
Examiner	:	SCOTT J. HAUGLAND

Mail Stop APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. BOX 1450
Alexandria, VA 22313-1450

AMENDED APPEAL BRIEF

Sir:

In response to the 24 January 2007 Notification of Non-Compliant Appeal Brief, Appellants submit this amended brief pursuant to the appeal from the Examiner's 11 July 2006 final rejection.

I. REAL PARTY IN INTEREST

The real party in interest is Electronics For Imaging, Inc., a Delaware corporation having a place of business at 303 Velocity Way, Foster City, CA 94404.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF CLAIMS

1, 16 and 18	Cancelled
2-15, 17 and 19-24	Rejected

IV. STATUS OF AMENDMENTS

None.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed subject matter pertains to printing systems used to print images on substrates. The printing systems include a transport belt that moves a substrate through the printing system, and a vacuum table that holds the substrate on the transport belt. In prior art vacuum table printing systems, the amount of required vacuum can vary significantly based on the portion of the vacuum table covered by the substrate. Some prior art printing systems have addressed this issue using complicated vacuum systems. The claimed invention, in contrast, addresses this issue without requiring complicated vacuum systems.

Independent Claim 21

Independent claim 21 recites apparatus for transporting a substrate 32 through a printing system 10. (Page 5, lines 3-13; FIG. 2A). In particular, claim 21 recites an apparatus that includes:

(a) a vacuum table 22 that has a substantially flat top surface and a plurality of holes 21, each hole 21 including a sidewall that extends to and is substantially perpendicular to the top surface and in fluid communication with a vacuum source 42 located within the vacuum table 22. (Page 6, lines 6-9; FIGS. 2A and 3A);

(b) a moveable transport belt 18 disposed above the top surface of vacuum table 22, the transport belt 18 including a plurality of holes 100 extending through a thickness of the belt. (Page 6, lines 13-15; FIGS. 2A, 2B and 3A); and

(c) a substantially flat porous sheet 43 disposed between the top surface of the vacuum table 22 and the transport belt 18, wherein the vacuum generated by vacuum table 22 creates a suction on a substrate 32 placed on the transport belt 18, and wherein the porous sheet 43 restricts fluid flow between the vacuum table 22 and the transport belt 18. (Page 6, line 20 through page 7, line 1; FIGS. 2A and 3A.

Independent Claim 23

Independent claim 23 recites a method for transporting a substrate 32 through a printing system 10. (Page 5, lines 3-13; FIG. 2A). In particular, claim 23 recites a method that includes:

(a) generating a vacuum with a vacuum table 22 that has a substantially flat top surface and a plurality of holes 21, each hole 21 including a sidewall that extends to and is substantially perpendicular to the top surface and in fluid communication with a vacuum source 42 located within the vacuum table 22. (Page 6, lines 6-9; FIGS. 2A and 3A);

(b) transporting the substrate 32 over the top surface of vacuum table 22 using a transport belt 18 that is disposed above the top surface and that includes a plurality of holes 100 extending through a thickness of the belt. (Page 6, lines 13-15; FIGS. 2A, 2B and 3A);

(c) disposing a substantially flat porous sheet 43 between the top surface of the vacuum table 22 and the transport belt 18, wherein the vacuum generated by vacuum table 22 creates a suction on the substrate 32, and wherein the porous sheet 43 restricts fluid flow between the vacuum table 22 and the transport belt 18. (Page 6, line 20 through page 7, line 1; FIGS. 2A and 3A); and

(d) maintaining the vacuum at a desired level as the area of the transport belt 18 covered by the substrate 32 varies as the substrate 32 is transported though the

printing system 10. (Page 6, line 22 through Page 7, line 1).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claims 2-15, 17, 19-21 and 23 are unpatentable under 35 U.S.C. § 103 over Yraceburu et al U.S. Patent No. 6,409,332 ("Yraceburu") in view of Mittmeyer et al U.S. Patent No. 5,232,141 ("Mittmeyer").

VII. ARGUMENT

The Examiner has rejected claims 2-15, 17, 19-21 and 23 under 35 U.S.C. § 103(a) as obvious over Yraceburu in view of Mittmeyer. In addition, the Examiner has rejected claims 22 and 24 under 35 U.S.C. § 103(a) as obvious over Yraceburu, Mittmeyer and Ju. Appellant disagrees, and respectfully requests that the Board reverse the decision of the Examiner.

Summary of Examiner's Rejections

The Examiner asserts that Yraceburu discloses an apparatus and method for transporting a substrate 16 in a printing system including a transport belt 32, a vacuum table 307, 311 and a porous sheet 318 or 323 for restricting fluid flow between the table and the belt. (11 July 2006 Final Office action "Final Action" at 2). The Examiner acknowledges that Yraceburu does not disclose that porous sheet 318 or 323 is positioned between belt 32 and vacuum table 307, 311. Id.

The Examiner asserts that Mittmeyer teaches forming a vacuum roller with a porous layer of material 1, 1A located between a top or outer surface of a vacuum box 2, 2A and web material held against the roller during transport. Final Action at 3. The Examiner summarily concludes that it would have been obvious to locate Yraceburu's porous sheet 318 or 323 between the top of vacuum table 311 and transport belt 32 because: (1) the porous material 318 or 323 would provide the desired function of equalizing pressure distribution and filtering air whether placed above vacuum table 311 or below it; and (2) placing a porous sintered material against the belt 32 provides the advantage of forming a smooth sliding surface for the belt to minimize wear and friction. Final Action at 3.

Discussion of Yraceburu

Yraceburu describes an apparatus 10 that includes a vacuum box 307 having a lid 317 and a platen 311. (Col. 5, lines 4-13 and lines 43-44). Platen 311 is mounted atop lid 317 and includes an array of vacuum passageways, or ports, 315 distributed across the surface. (Col. 5, lines 16-17; Col. 6, lines 6-10; FIG. 3). Lid 317 is layered or graduated from a relatively porous coarse material 318 to a relatively dense fine material 323, and functions to trap ink mist and paper dust, and provide flow restriction. (Col. 5, lines 38-65; Col. 6, lines 6-10). A perforated transport belt 32 is disposed above platen 311, and is used to transport a paper sheet 16. (Col. 4, lines 16-17; Col. 5, lines 4-8; FIG. 3).

Yraceburu is not silent about the location of lid 317. Indeed, Yraceburu repeatedly specifies that lid 317 is located between platen 311 and vacuum box 307. See, e.g., Col. 2, lines 44-56 (stating that platen 311 is "mounted adjacent to the filter mechanisms [i.e., lid 317] distally from the vacuum box [307]" (emphasis added); Col. 2, lines 60-65 (stating that the invented methods include "drawing a vacuum through a plurality of vacuum ports distributed across the platen [311]; and filtering the airflow through the ports via an airflow restrictive porous material interposed between the platen and the vacuum inducing mechanism" (emphasis added); Col. 3, lines 4-9 (stating that the vacuum platen system has a "vacuum platen [311], having a plurality of vacuum ports therethrough, a vacuum chamber, having one wall thereof fabricated of a porous material [i.e., lid 317], the one wall being adjacent the platen such that the material forms a flooring for each of the ports . . . ." (emphasis added). Moreover, Yraceburu's claims expressly state that lid 317 is located between platen 311 and vacuum box 307. See, e.g., Col. 7, lines 7-12 (claiming a vacuum platen system that includes a platen means "mounted adjacently to the filter means, and distally from the vacuum box" and that the platen means has "a plurality of vacuum passages therethrough such that regions of the filter means form a porous floor for each of the passages" (emphasis added).

In addition to expressly stating and claiming that lid 317 should be located between platen 311 and vacuum box 307, Yraceburu also explains the reason for this restriction. In particular, Yraceburu specifies that an advantage of the invention is that it "provides a platen that is resistant to clogging by ink and paper dust." (Col. 3, lines 16 and 31-32). Indeed, Yraceburu states that "[i]t is preferable that vacuum ports 315 be large enough so that they do not clog with ink or paper dust." (Col. 5, lines 38-39).

To achieve this goal, Yraceburu states that lid 317 is preferably layered, or graduated, from being relatively porous (coarse material 318) proximate the underside of platen 311 to relatively dense (fine material 323) superjacent to the vacuum box 307. (Col. 6, lines 6-10). By so doing "[a]ir flow through the coarse material region 321 at the floor of each port 315 is freer, removing ink mist, paper dust, and other known ink-jet process contaminants through the ports 315, particularly via open ports or partially open ports 315′."

Discussion of Mittmeyer

Mittmeyer pertains to a suction roller arrangement for transporting web-form material. (Col. 1, lines 15-16). A suction roller is used to convert a torque into a tractive force in webs of material in coating machines, such as for coating photo paper, film or magnetic tape. (Col. 1, lines 24-29). In particular, Mittmeyer describes a suction roller that includes a hollow cylindrical roller body 1 (also referred to as a rotor) made of a porous sintered material that rotates about a stator 2 that includes openings or holes 10 for transferring intake air to the interior 11 of stator 2. (Col. 2, line 59 through Col. 3, line 5). To create a differential air resistance along the length of the suction roller, roller body 1 has pores that have a larger diameter in the central portion of the roller body than in the peripheral portion 9, 9′. (Col. 3, lines 13-24). A web 6 of material is looped over a portion of the outside surface of roller body 1. (FIG. 2).

Discussion of the § 103(a) Rejections

A claimed invention is unpatentable as obvious "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." §103(a). As the Court of Appeals for the Federal Circuit has repeatedly stated, an obviousness determination may not be based on hindsight. The Examiner has ignored this prohibition, and has used Appellant's disclosure to selectively excise portions of Yraceburu and Mittmeyer to arrive at the claimed invention.

First, although Yraceburu expressly (and repeatedly) specifies and claims that lid 317 is located between vacuum box 307 and platen 311, the Examiner has failed to provide any explanation for contradicting this express teaching. Instead, the Examiner ignores all of the express restrictions and the stated reasoning for locating lid

317 between vacuum box 307 and platen 311, and essentially concludes that the location of lid 317 is immaterial.

As described above, however, nothing in Yraceburu suggests that the location of lid 317 between vacuum box 307 and platen 311 is immaterial. Quite the contrary, a person of ordinary skill in the art would more likely conclude that the location of lid 317 between vacuum box 307 and platen 311 is critical. Indeed, in describing a prior art vacuum device 201, Yraceburu notes that the use of smaller holes 207 in platen 211 caused several operational problems, including clogged holes with ink and paper dust. (Col. 4, lines 61-64). To overcome these problems, platen 311 includes vacuum ports 315 that are "large enough that they do not clog with ink or paper dust." (Col. 5, lines 37-38). Further, lid 317 is layered or graduated from a relatively porous coarse material 318 to relatively dense fine material 323. (Col. 6, lines 6-10). In this regard, "air flow through the coarse material region 321 at the floor of each port 315 is freer, removing ink mist, paper dust and other known ink-jet process contaminants through the ports 315," whereas "fine material 323 acts to restrict airflow to desired levels." (Col. 6, lines 10-15).

Thus, it is unlikely that a person of ordinary skill in the art would consider or be motivated to reposition lid 317 between platen 311 and perforated transport belt 32. If coarse layer 318 were moved above platen 311 (either by itself, or in conjunction with fine material 323), perforated transport belt seemingly would no longer smoothly move across the surface of coarse material 318, particularly when contaminants become trapped in the coarse material. Further, if fine material 323 alone were sandwiched between perforated transport belt 32 and platen 311, the unfiltered contaminants seemingly would quickly clog the fine material, and render the system useless. Thus, contrary to the Examiner's assertion, placing either or both components of lid 317 between perforated transport belt 32 and platen 311 would seemingly increase wear and friction on the belt, and degrade system performance.

Further, it is illogical to suggest that anyone would ever be motivated to modify Yraceburu in the way that the Examiner suggests based on Mittmeyer. Yraceburu describes a vacuum apparatus in which sheet 16 is transported by transport belt 32 across a surface of flat platen 311 while ink is deposited onto sheet 16. Mittmeyer describes a vacuum apparatus in which web 6 is transported by cylindrical roller body 1 about stator 2, while a coating is applied to web 6. Thus, both references describe apparatus in which a moveable transport device (transport belt 32 or roller

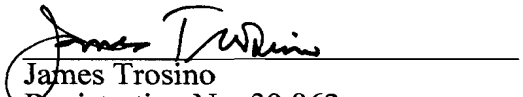
body 1) is disposed above or about the surface of a vacuum apparatus (platen 311 or stator 2), with nothing sandwiched between those elements. There is no logical reason why anyone reading Mittmeyer would somehow conclude that cylindrical roller body 1, which functions as a transport mechanism, should be flattened and then sandwiched between another transport mechanism (transport belt 32) and platen 311. Indeed, the only reason for even considering the combination of Yraceburu and Mittmeyer is based on hindsight gleaned from applicants' disclosure, and such hindsight reconstruction is impermissible.

Because Yraceburu expressly teaches away from the claimed invention, and because the combination of Yraceburu and Mittmeyer, even if possible, would not produce the claimed invention, Appellants respectfully request that the Board reverse the Examiner's rejections of claims 21 and 23. Because all other claims depend from either claim 21 or 23, Appellants further respectfully request that the Board reverse the Examiner's rejections of claims 2-15, 17, 19-20, 22 and 24.

Conclusion

For all of the foregoing reasons, Appellants respectfully request that the Board reverse the Examiner's rejections of claims 2-15, 17 and 19-24. Appellants further respectfully request that the Board direct the Examiner to allow claims.

Respectfully submitted,



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CLAIMS APPENDIX

1. (Cancelled)

2. (Previously Presented) The apparatus of claim 21, wherein the desired vacuum is maintained in the range from about -0.05 psi to about -0.3 psi.

3. (Previously Presented) The apparatus of claim 21, wherein the vacuum table is coupled to a motor which generates a vacuum.

4. (Original) The apparatus of claim 3, wherein the motor is coupled to a CPU which instructs the motor as to the amount of vacuum to generate.

5. (Original) The apparatus of claim 3, wherein the vacuum table is coupled to a vacuum sensor which detects the vacuum provided by the vacuum table.

6. (Original) The apparatus of claim 5, wherein the vacuum sensor and the motor are coupled to a CPU which receives vacuum information from the sensor and sends instructions to the motor.

7. (Previously Presented) The apparatus of claim 21, wherein the transport belt is made from woven polyester.

8. (Previously Presented) The apparatus of claim 21, wherein the transport belt is made from a reinforced polyurethane material.

9. (Original) The apparatus of claim 7, wherein the transport belt has a thickness of about 0.09 inch.

10. (Previously Presented) The apparatus of claim 21, wherein the holes of the transport belt are spaced apart by about 1 inch.

11. (Previously Presented) The apparatus of claim 21, wherein the holes of the transport belt have a diameter of about 0.1 inch.

12. (Previously Presented) The apparatus of claim 21, wherein the transport belt is made from stainless steel.

13. (Original) The apparatus of claim 12, wherein the thickness of the transport belt is about 0.008 inch.

14. (Previously Presented) The apparatus of claim 21, wherein the porous sheet is made of sintered, porous polyethylene.

15. (Original) The apparatus of claim 14, wherein the porous sheet has a thickness of about 0.5 inch.

16. (Cancelled)

17. (Previously Presented) The method of claim 23, wherein the desired level of vacuum is maintained from about -0.05 psi to about -0.3 psi.

18. (Cancelled)

19. (Previously Presented) The method of claim 23, wherein the porous sheet acts as a flow restrictor.

20. (Previously Presented) The method of claim 23, wherein the porous sheet distributes the vacuum over a region of the transport belt.

21. (Previously Presented) An apparatus for transporting a substrate through a printing system, the apparatus comprising:

a vacuum table that comprises a substantially flat top surface and a plurality of holes, each hole comprising a sidewall that extends to and is substantially perpendicular to the top surface and is in fluid communication with a vacuum source located within the vacuum table;

a moveable transport belt disposed above the top surface of the vacuum table, the transport belt comprising a plurality of holes extending through a thickness of the belt; and

a substantially flat porous sheet disposed between the top surface of the vacuum table and the transport belt, wherein the vacuum generated by the vacuum table creates a suction on a substrate placed on the transport belt, and the porous sheet restricts fluid flow between the table and the transport belt.

22. (Previously Presented) The apparatus of Claim 21, further comprising an indicator that detects the thickness of the substrate as the substrate moves through the printing system.

23. (Previously Presented) A method for transporting a substrate in a printing system, the method comprising:

generating a vacuum with a vacuum table, the vacuum table comprising a substantially flat top surface and a plurality of holes, each hole comprising a sidewall that extends to and is substantially perpendicular to the top surface and is in fluid communication with a vacuum source located within the vacuum table;

transporting the substrate over the top surface of the vacuum table using a transport belt that is disposed above the top surface and that comprises a plurality of holes extending through a thickness of the belt;

disposing a substantially flat porous sheet between the top surface of the vacuum table and the transport belt, wherein the vacuum generated by the vacuum table creates a suction on the substrate and the porous sheet restricts fluid flow between the table and the transport belt; and

maintaining the vacuum at a desired level as the area of the transport belt covered by the substrate varies as the substrate is transported though the printing system.

24. (Previously Presented) The method of Claim 23, further comprising detecting the thickness of the substrate as the substrate moves through the printing system.

EVIDENCE APPENDIX

None.

RELATED PROCEDINGS APPENDIX

None.